

Claims

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1. A fastener for members (M1, M2) to be clamped with a certain spacing therebetween, the fastener comprising a nut (10) having one end surface of a substantially cylindrical-shaped main body adapted to be latched by one (M1) of the members to be clamped, the nut being formed on an inner peripheral surface thereof with a first thread (13) comprising an internal thread capable of threading onto a thread of a bolt (40) and a second thread (14) comprising an internal thread inverse to thread ridges of the thread of the bolt and capable of threading onto a first thread (21) of a movable collar (20) comprising an external thread, which is formed on an outer peripheral surface of a substantially cylindrical-shaped main body of the movable collar (20) and is inverse to thread ridges of the thread of the bolt; the movable collar (20) having in an inner bore thereof a torque transmitting means capable of transmitting torque of the bolt, which is inserted axially into the inner bore, to the movable collar through thread-thread engagement; and the bolt (40) having a shank (42), on an outer peripheral surface of which is formed a thread comprising an external thread capable of threading into the first thread (13) of the nut; and wherein a portion of the thread of the bolt comprises special thread ridges (422), by which a frictional force greater than that obtained in engagement between normal threads is imparted to the thread-thread engagement.

2. The fastener according to claim 1, wherein the torque transmitting means is a second thread (22) comprising an internal thread formed on an inner peripheral surface of the movable collar (20) and capable of threading onto the thread of the bolt (40).

3. The fastener according to claim 1, wherein the torque transmitting means comprises a torque transmitting nut (30) with an outer peripheral surface thereof abuttingly received in the inner bore of the movable collar (20) to such an extent that rotation thereof about an axis thereof is substantially restricted, and a torque transmitting nut latch (23) comprising a cavity, a cross section of which is similar to the torque transmitting nut.

4. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) comprise thread ridges obtained by subjecting common thread ridges to compressive deformation in a diametrical direction.

5. The fastener according to claim 4, wherein a region where the special thread ridges (422) are formed is around 2 to 10 in terms of the number of thread ridges and around 10 to 90 degrees in terms of an angle about an axis.

6. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) have a greater pitch (P2) than a pitch (P1) of a common thread ridge or a less pitch (P3) than the pitch (P1) of the common thread ridge.

7. The fastener according to claim 6, wherein a region where the special thread ridges (422) are formed has a pitch (P2) or (P3) of around $\pm 20\%$ of (P1) and at least one thread ridge in + and - directions, respectively.

8. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) comprise a thin layer of a special nylon resin formed on a common thread ridge (421).

9. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) comprise a common thread ridge formed of an elastic body.

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10. The fastener according to claim 9, wherein the elastic body is formed of an elastomer resin.

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10 11. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) are not provided and a part of thread ridges of a second thread (22) of the movable collar (20) or of a thread (31) of a torque transmitting nut (30) comprises thread ridges obtained by subjecting common thread ridges to compressive deformation in a diametrical direction.

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12. The fastener according to claim 11, wherein a region where the thread ridges obtained by subjecting the common thread ridges to compressive deformation in the diametrical direction are formed is around 2 to 10 in terms of the number of thread ridges and has around 10 to 90 degrees in terms of an angle about an axis.

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13. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) are not provided and a part of thread ridges of a second thread (22) of the movable collar (20) or of a thread (31) of a torque transmitting nut (30) has a greater pitch (P2) than a pitch (P1) of a common thread ridge or a less pitch (P3) than the pitch (P1) of the common thread ridge.

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14. The fastener according to claim 13, wherein a region where the thread ridges having a greater pitch (P2) than a pitch (P1) of the common thread ridges or a less pitch

(P3) than the pitch (P1) of the common thread ridges are formed has a pitch (P2) or (P3) of around $\pm 20\%$ of (P1) and at least one thread ridge in + and - directions, respectively.

5 15. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) are not provided and thread ridges of a second thread (22) of the movable collar (20) or of a thread (31) of a torque transmitting nut (30) is formed thereon with a thin layer of a special nylon resin.

10 16. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) are not provided and a part of thread ridges of a second thread (22) of the movable collar (20) or of a thread (31) of a torque transmitting nut (30)
15 comprises common thread ridges formed of an elastic body.

17. The fastener according to claim 16, wherein the elastic body is formed of an elastomer resin.

20 18. The fastener according to claim 2 [or 3], wherein the special thread ridges (422) of the bolt (40) comprise thread ridges obtained by subjecting common thread ridges to compressive deformation in a diametrical direction, and said special thread ridges are additionally formed in either of
25 the second thread (14) of the nut or the first thread (21) of the movable collar within a range over which they can be threaded each other at the time of completion of clamping.

30 19. The fastener according to claim 18, wherein a region where the special thread ridges (422) are formed is around 2 to 10 in terms of the number of thread ridges and around 10 to 90 degrees in terms of an angle about an axis.

20. The fastener according to claim 2 ^{or 3}, wherein the special thread ridges (422) of the bolt (40) have a greater pitch (P2) than a pitch (P1) of a common thread ridge or a less pitch (P3) than the pitch (P1) of the common thread
5 ridge, and said special thread ridges are additionally formed in either of the second thread (14) of the nut or the first thread (21) of the movable collar within a range over which they can be threaded each other at the time of completion of clamping.

10 21. The fastener according to claim 20, wherein a region where the special thread ridges (422) of the bolt (40) are formed has a pitch (P2) or (P3) of around $\pm 20\%$ of (P1) and at least one thread ridge in + and - directions,
15 respectively.

22. The fastener according to claim 2 ^{or 3}, wherein the special thread ridges (422) comprise a thin layer of a special nylon resin formed on a common thread ridge (421),
20 and said special thread ridges are additionally formed in either of the second thread (14) of the nut or the first thread (21) of the movable collar within a range over which they can be threaded each other at the time of completion of clamping.

25 23. The fastener according to claim 2 ^{or 3}, wherein the special thread ridges (422) comprise a common thread ridge formed of an elastic body, and said special thread ridges are additionally formed in either of the second thread (14) of
30 the nut or the first thread (21) of the movable collar within a range over which they can be threaded each other at the time of completion of clamping.

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24. The fastener according to claim 23, wherein the elastic body is formed of an elastomer resin.

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